PEER REVIEW GUIDELINES FOR ARS PANEL CHAIRS AND REVIEWERS

Thank you for agreeing to serve as a peer reviewer for the Agricultural Research Service's Office of Scientific Quality Review (ARS OSQR). ARS Project Plan Peer Review (PPPR) is a unique process that is unlike competitive review. These guidelines provide an overview of how the process works and what is expected of peer reviewers.

These guidelines have been written to prepare you for your review, please read them carefully. Contact the OSQR staff (OSQR@usda.gov) if you have questions.

Peer Reviewer Guidelines for ARS Project Plans

Peer review of the Agricultural Research Service (ARS) research was mandated by the 1998 Farm Bill (The Agricultural Research Extension, and Education Reform Act of 1998, Public Law 105-185). The Act calls for external reviewers to consider the scientific merit of research, its relevance in relation to established priorities, and its national or multistate significance. The review focuses on the technical quality of a proposed 5-year research plan. Reviewers are chosen for their relevant scientific expertise and are selected worldwide from academia, state and federal agencies, industry, or the non-profit sector.

ARS Project Plans

ARS projects are intended to address intramural research needs, problems, and/or challenges. Frequently, they examine applied questions and issues of immediate need to agriculture and its stakeholders. Work is often long-term, and while direct application may not be immediate, the work is ultimately intended to address specific agricultural concerns.

This is NOT a competitive (or grant) review in which plans are ranked against one another to determine funding amounts. Predetermined resources will be available for all approved plans. The primary responsibility of an external reviewer is to assess the approach and procedures, merit and significance, and overall probability of success per the stated objectives and subobjectives. Also, when appropriate, make recommendations for enhancement, improvement, or additional considerations.

Agency Personnel Responsibilities

In addition to peer reviewers, Project Plan Peer Review (PPPR) requires the involvement of several individuals and groups within ARS. They are briefly summarized below.

- **OSQR Director/Coordinator** communicates and enforces Agency policy and requirements, selects chairs for panels (along with SQRO), provides orientations to panel chairs and panelists, combines comments from panelists, and holds panel meetings and provides oversight.
- **Scientific Quality Review Officer (SQRO)** provides scientific oversight (similar to a journal editor), selects chairs for panels (along with OSQR Director), serves as technical editor during the review process, ensures researchers address all panel comments, and ultimately, is solely responsible for certifying project plans.
- **Office of National Programs (ONP)** develops the Action Plan (which provides program direction and management) and the Program Direction Resource Allocation Memo (PDRAM) which specifies project plan objectives, verifies adherence of project plans to the Action Plan, approves any changes to project plan objectives, provides recommendations for chairs and panelists, optionally participates in the chair orientation to provide overviews of the National Program area, and has a role in

assisting researchers in responding to panel recommendations. In the case of failed plans, ONP assists in the required response documents.

- **Area Staff and Scientists** prepare the project plan according to the Action Plan, and update and revise the plan based on recommendations provided by the review panel.

Peer Reviewers

Knowledgeable reviewers are the cornerstone of the PPPR process. OSQR staff works closely with panel chairs in the selection of their reviewers and ensures that the nature of plans and expectations are clear. The Agency is strongly committed to maintaining the strength, integrity, diversity, and independence of its review process.

Orientation. Panelists receive a briefing on the process and their responsibilities from the OSQR staff. The relevant National Program Leader also may provide an overview of the National Program being reviewed.

Confidentiality. ARS project plans may include detailed information about research strategies and existing or anticipated research results. *The Agency considers research plans, review documents, and review discussions to be proprietary information of a confidential nature.* Thus, all participants sign a Confidentiality Agreement before receiving materials for review. The Agreement is a legally binding document. Under penalty of law, reviewers may not copy, quote, or otherwise use material gained during the Peer Review Process. Reviewers may not disclose or discuss information in project plans with colleagues or others outside of the assigned review panelists. **At the conclusion of the review, all electronic or paper copies of plans and associated materials must be erased or destroyed.**

Anonymity of Reviewers. Panel chairs are publicly known. Their written statements on a panel's experience become part of a publicly available report (Panel Chair Statement). However, the other panelists remain anonymous, and identities are treated as confidential. Panelists are asked to respect the anonymity of their fellow reviewers and ARS scientists associated with reviewed plans, both during and after the completion of review. Reviewers, when asked, indicate that it affords them the ability to evaluate research candidly and honestly.

Conflicts of Interest. All potential reviewers are examined for conflicts of interest and reviewers are asked to alert the OSQR should they feel that there is a potential issue. Conflict of interest guidelines encompass four general areas described below.

- *Collaboration:* Planning and/or conducting of joint research or co-authorship of publications or grant applications within the past four years. Employee relationship within the last 36 months.
- *Student/Mentor Relationship:* An undergraduate, graduate, postdoctoral advisor, or similar relationship within the past eight years.
- *Institutional Affiliation:* Sharing the same institution with the researchers, particularly if from the university or college department with which the ARS researchers are affiliated.

- *Financial Gain:* The potential to receive direct financial gain or the holding of financial interests that are affected directly by the research.

Note: these are general guides and specific circumstances may preclude an issue being a source of conflict.

The Review Process

PPPR is more analogous to review of a manuscript than a competitive grant application. While all plans receive an overall Consensus Class Score, it is the comments and recommendations from review panels and the requirement that these be addressed by research teams which make this process unique.

The Scientific Quality Review Officer (SQRO) functions much like a journal technical editor, ensuring thorough and complete response to reviewer concerns. The panel's results fall within five broad areas:

- **No Revision Needed.**
- **Minor Revision Needed.**
- **Moderate Revision Needed.**
- **Major Revision.**
- **Not Feasible.**

Briefly, for Consensus Class Scores of No Revision, Minor, or Moderate Revision, the SQRO ensures that review comments and recommendations are adequately and thoughtfully addressed before certifying the plan. If the SQRO feels any part of the recommendations are not adequately addressed, he/she may return the document to the team requesting further detail/explanation. If, and when, responses are not satisfactory, a return letter option exists that involves declination of certification and return of the plan to the team for further improvement.

For those plans scoring Major Revision or Not Feasible, the panel will review a revised plan and researcher responses and provide a new Consensus Class Score. If that outcome is No, Minor, or Moderate Revision, the SQRO assumes responsibility as above. If the plan does not achieve this level, it fails review.

Reviewer Responsibilities

Each panel member is typically assigned one plan for which he/she serves as primary reviewer and one as secondary reviewer. Both Primary and Secondary reviewers read the plan and provide detailed written comments on a provided form. These completed reviews are

requested to be sent to the by the OSQR seven business days in advance of the online panel meeting.

In preparation for a fruitful discussion, every reviewer should read and be familiar with all other plans scheduled during their review panel. For these other plans (those for which a panel member is not assigned as the primary or secondary reviewer), an optional Reviewer Comment Form is provided, to note any specific issues he/she feels should be addressed in the review. This should also be sent to the OSQR seven business days in advance of the online panel meeting.

Primary and Secondary written reviews will be requested by OSQR seven business days before your online meeting.

Primary and Secondary reviews, as well as any other reviewer comments received, are combined into a draft Panel Recommendations Report. This is sent to the panel 24-48 hours prior to the meeting and is reviewed and edited by the panel during the online discussion.

Plan Structure

Generally, ARS Project Plans are more wide ranging and less detailed than the competitive plans with which reviewers may be familiar. While reviewers may not find fully detailed procedures, the plan is expected to contain sufficient information to provide confidence that the research team has a clear understanding of the problems and the technologies elaborated in the plan. Further detail may be found in the Peer Review Handbook available at https://www.ars.usda.gov/ARSUserFiles/osqr/data-upload/PPPR%20Handbook%2012-2021.pdf.

All plans follow the Project Plan Template (Appendix 2) and typically contain three to five objectives (though this varies depending on the National Program) and can encompass the work of several scientists or engineers. Objectives may be diverse, involving an array of issues, and may include several cooperating investigators. The plan should, however, provide guidance in its early pages as to how the group of objectives and research threads relate to one another. Occasionally, one or more objectives within a plan may appear to be significantly outside the scope of the rest of the work. In such cases, the plan should clearly convey that this component, while part of a larger plan, is designed to proceed independently.

Can panels edit or redirect objectives?

Plan objectives are NOT investigator-generated, but rather are assigned to research teams as part of the coordinated, problem-solving effort of the ARS Office of National Programs to which the investigators are aligned. The goals of the National Program are described in a 5-year Action Plan (these are provided to reviewers and available for each National Program at www.ars.usda.gov/research). Thus, plan objectives set forth issues or goals that may not be fully encompassed by the research. As a result, plans often present subobjectives that are developed by research teams to provide a more focused project. Researchers are not permitted to redirect research but are required to develop their plans in response to the stated objectives.

Reviewers are asked, therefore, to treat objectives as assigned. However, the sub-objectives are of the purview of the research team and are subject to panel scrutiny.

What if one objective is weak?
While not common, there are times when an otherwise strong plan contains an objective or subobjective that is weak or poorly described. In such cases, it is the task of the panel to weigh this against the other parts of the plan in coming to a final score. Such a plan may score high with specific recommendations to address or eliminate the weakness or, alternately, may score low if it is felt that the weakness seriously jeopardizes the strength of the remaining aspects of the plan.

Review Criteria

Reviewers are asked to provide written reviews of the plans that address three criteria: adequacy of approach and procedures; probability of successfully accomplishing the project objectives; and merit and significance of the work.

Adequacy of Approach and Procedures
The review should encompass:

- Whether the hypotheses and/or plan of work are well conceived.
- Whether the experiments, analytical methods, and approaches and procedures are current, appropriate, and sufficient to accomplish the objectives.
- How can the approach or research procedures be improved?
- Are the roles of researchers and collaborators clear and understood?

This is typically the longest portion of the document (2 to 4 pages). Reviews are organized by objective/sub-objective and address strengths and recommendations for improvement.

Probability of Successfully Accomplishing the Project Objectives
The section considers the feasibility of the project including:

- The probability of success in light of the investigator or project team's training, research experience, preliminary data if available, and past accomplishments.
- Whether the objectives are both feasible and realistic within the stated timeframe and with the resources proposed.
- Whether the investigators have adequate knowledge of the literature as it relates to the proposed research.

By its long-term nature, ARS research may take on greater risk than that seen in competitively awarded projects.

Because the ARS research cycle is five years, project plans may include approaches that are unusual, nontraditional, or have a high risk of failure. Such creativity is strongly encouraged and plans should clearly indicate understanding of such approaches.

Merit and Significance

This assesses the likely impact of the research.

- Will the project, if successful, enhance knowledge of a scientifically important problem?
- Will the project lead to the development of new knowledge and technology?
- Are there other data/studies relevant to this research effort?
- If applied research, is it of value to customers or stakeholders?

Products of the Review

Following review, researchers receive a *Consensus Class Score and a Panel Recommendations form that contains the panel's assessment of the plan's* strengths, needs, and opportunities for improvement.

Consensus Class Score (Assessment)

The Federal Advisory Committee Act (https://www.gsa.gov/policy-regulations/policy/federal-advisory-committee-management/legislation-and-regulations/the-federal-advisory-committee-act) requires that OSQR receive an independent score from each panelist (including the panel chair) representing his/her opinion of the plan's quality. These scores are numerically averaged to determine a Consensus Class Score for the plan. In general, the Consensus Class Score reflects the degree of revision needed to improve the overall scientific quality of the project plan. The Action Classes are defined below (see also Appendix 3):

I. *No Revision Required*. No revision is required, but minor changes to the project plan may be suggested.

II. *Minor Revision Required*. The project plan is feasible as written and requires only minor clarification or revision to increase quality to a higher level.

III. *Moderate Revision Required*. The project plan is basically feasible but requires changes or revision to the work on one or more objectives, perhaps involving alteration of the experimental approaches, in order to increase quality to a higher level and may need some rewriting for greater clarity.

IV. *Major Revision Required.* There are significant flaws in the experimental design and/or approach or a lack of clarity which hampers understanding. Significant revision is needed.

V. *Not Feasible.* The project plan, as presented, has major flaws or deficiencies, and cannot be simply revised. Deficiencies exist in approach, experimental design, presentation, or expertise, which make it unlikely to succeed.

Combined Recommendations Form (Advisory)

The combined recommendations form is the panel's communication to the research team. Individual reviewer comments are not provided. This is based on the Primary and Secondary reviews, other written reviewer comments, and the panel discussion.

Writing a Review

All reviewers receive the plans for review as well as comment forms. Primary and Secondary reviewers are assigned by the panel chair and receive specific forms on which they are to place their comments related to the above three review criteria. These forms are provided to the panelists along with a due date at least three weeks prior to the panel. *A reminder email five to seven days before the panel meeting will request that these completed forms be sent back to OSQR.*

To aid in preparing the final comments, the form requests a standard format for the Approach and Procedures criterion, which typically occupies the largest portion of the review document, as follows:

Review the pieces of the project by objective or sub-objective, providing an overall assessment followed by the strengths and recommendations for improvement of the plan as presented. These comments should be sufficiently detailed to provide the research team direction as they revise their plan. You should provide guidance on deficiencies but not prescriptive measures to redesign the work, as this is the responsibility of researchers as they respond to your review. Guidance for scoring plan are included in Appendix 3.

For the next two criteria (Probability of Success; Merit and Significance), an overall assessment is sufficient unless there are specific issues that must be addressed within one or more objectives or sub-objectives. In preparing a review, the following are also important:

- Use third-person statements (the plan's strengths are…, the panel suggests…) rather than first person ("I", "me", or "my"). These will be edited out of the consensus document.
- Clearly differentiate between substantive and minor criticisms.
- Provide suggestions for correction of problems that your panel considered substantive.
- When citing other research, provide references or other documentation.
- Avoid direct commentary that might be misconstrued as specifically targeted at individual scientists or maligning an individual's character.

Response to Reviewers and Revisions

A unique and defining feature of PPPR is a requirement that researchers respond, in writing, to reviewer comments. For nearly all reviews (even when the final score is "No Revision Needed"), there are issues or questions for which the research team must provide a response.

Form of the Response

Once the panel has completed review and provided their consensus recommendations, the OSQR team reviews these and inserts **"ARS Response Boxes"** into the text at places where there is request for further information, a question, or need for the researchers to comment. It is the responsibility of the research team to address the stated issues wherever a box appears.

For each response there must be three elements:

1. Direct answer or comment on the issue;
2. Indication of location (page) where a change is made to the plan; and
3. The above changes/additions marked in **bold** in a revised plan**.**

The review comments with the completed responses and the revised plan are provided to the SQRO or panel (depending upon the initial score) for evaluation.

Appendix 1. Frequently Asked Questions

How much time should I expect to spend on the reviews?
Most reviewers report that they spend 4-6 hours on each in-depth review, sometimes longer, depending on the length of the plan and the number of objectives. We encourage you to start early.

A plan has one or more scientific vacancies, how am I to assess that?
Where possible, we urge research teams to put together a plan and seek assistance from others in developing those parts that would fall to the vacant position. If, when the position is filled, the new individual's research departs significantly from that plan, their portion of the work may be subject to a new, external review.

This plan is somewhat short on detail and lacks a fully detailed literature review.
Researchers are subject to page limitations when preparing their plans. We urge them to provide a "gap analysis" that cites the principal literature rather than an extensive literature review to reserve enough of the remaining pages for the approach and procedures. Nonetheless, with a five-year plan, large team, and multiple objectives and sub-objectives, the detail possible within the allowed pages can be constrained.

Why are there no budgets in these plans?
The focus of this review is the scientific and technological soundness of the plan. The budgets for this research have already been set but will not be released unless the plan successfully completes review. There are many factors, in addition to scientific considerations, that go into arriving at the budget that are beyond the scope of this review. Finally, the assessment of the availability of adequate funding is the responsibility of Research Leaders and Area Offices and is part of the internal review that plans receive before submission for review.

Can we change the plan's objectives to better match the proposed work?
Objectives are often broader in scope than the research to allow the scientist room to exercise originality and creativity. Therefore, it is preferred to ask for greater clarity on how the objective is being addressed rather than to narrow its scope. Where research proposed does not match the objective in some way, the recommended corrective action should be to the plan itself and not the objective.

In some plans, one objective appears to be an "outlier." Why is it there?
If a seeming outlier is part of a project plan, it is the responsibility of those preparing the plan to provide the context for each of the objectives. If this is not clear, you are encouraged to ask the researcher to provide it, as part of your review. There are times when mandates or stakeholder needs necessitate a specific separate activity within a plan. This is part of the nature of intramural research.

Can we score the projects by objective vs. assigning one score to the entire plan?
No, the projects are designed to operate as a unified entity. The final score can reflect your assessment of the relative importance of strong and weak portions of the plan. It is important to remember that even for those plans receiving a good score, ANY recommendations made by the panel must be thoroughly and completely addressed in a revised plan before it can be certified.

A project plan is scientifically sound but poorly written. Should I consider it a good plan? When scoring the project, how much weight is put on poor presentation?
Each project plan you review should demonstrate a high likelihood of success without requiring that reviewers make inferences or assumptions. If the plan inadequately presents the information needed to apply the review criteria, we ask that you address the inadequacy in your peer review. Depending on the type of presentation flaw, you'll need to judge which action class is most appropriate. The goal is a plan that is both scientifically sound *AND* well-presented.

May I call or visit with the research teams to discuss their project plans?
No. All the information you need to complete your review should be enclosed in the plan. If you have specific questions, contact the OSQR Director or SQRO.

Once the panel has finished its initial discussions, is my job as a reviewer over?
Yes, when a passing consensus score is reached, the panel's obligation is complete.

No, if a failing consensus score is reached. Initial scores of a Major Revision or Not Feasible, call for a rereview. This is an opportunity for the research team to revise or rewrite the failed plan and have it considered again for comments and a second score. At most, a rereview occurs within 12 weeks of the initial review and regardless of the outcome, the panel's obligation is complete.

Are there any helpful tips for writing reviews?
Do Use: This project needs _____ equipment because….
Don't Use: The Panel is not sure whether the project has sufficient funds to purchase _____...
(Budget is not part of this review)

Do Use: This project would benefit from the expertise of Dr. _____ at the_____ ARS location. The panel suggests a collaboration between…
Don't Use: Dr. _____ should be reassigned to _____ARS location…
(OSQR reviews do not assess agency issues)

Do Use: The project is relevant to the National Program Action Plan…
Don't Use: The National Program Action Plan should/should not include _____ goals…
(The Action Plan is established through a different process and is not reviewed by OSQR panels)

Appendix 2. Project Plan Template

OSQR PROJECT PLAN TEMPLATE

A Word file needs to be created and formatted as follows:

- 8.5x11 letter portrait
- Single spaced
- 11-pt, Calibri font
- 14-pt, Calibri (Headers only)
- 12-pt, Calibri (Sub-headers only)
- 1" margins all around
- Left justified
- No end-of-line hyphens
- Header on all pages with Lead Scientist's last name at the left and page number placed flush right, **excluding the cover page**
- Footer on all pages as shown in the template, **excluding the cover page**
- Page breaks as indicated on this document

Background through Approach and Procedures should be 12 pgs., not to exceed 27 pgs., based solely on the number of SYs listed on a project plan:

SYs on Project Plan (fractional FTEs round up)	**Page Number - Max** (suggested background page length)
<2	**12 (**5**)**
2-3.9	**17 (**6**)**
4-6.9	**23 (**8**)**
7+	**27 (**8**)**

Project Plan

NP XXX – Insert National Program Name

5-Year Review Cycle (Year –Year)

Old Research Project Number

XXXX-XXXXX-XXX-00D

Research Management Unit

Enter Name of Unit

Location – City and State

Enter City and State

Project Title

Enter name of project from approved PDRAM

Investigators	**FTE**
Enter Investigator First and Last Name	1.00
Enter Investigator First and Last Name	1.00
Enter Investigator First and Last Name	1.00

Planned Duration..... # months

Signature Page (Pre-Peer Review)

(SIGNATURE AND DATES MUST BE COMPLETE PRIOR TO DISTRIBUTING THIS PROJECT PLAN TO THE OSQR)

Lead SY Full Name, Project Number and (NP#)

This project plan demonstrates clearly how the research team will conduct research in a manner appropriate for this area of study. The funds committed toward this project are sufficient to support the planned research.

Research Leader	**Date**

This project plan was prepared by a qualified research team and demonstrates the research team's best effort towards achieving the assigned research objectives.

Center Director/Location Coordinator	**Date**

All internal review and approval requirements have been met. This project plan is relevant to the Agricultural Research Service's National Program [enter NP # and title] Action Plan and was prepared in accordance with the outlined objectives, experimental approach, and project duration previously agreed to by the National Program Team and Research Team. The project plan is now available for peer review.

Area Director	**Date**

This Pre-Peer Review Project Plan embodies the objectives described in the related PDRAM or those subsequently approved by the Office of National Programs, and the approaches are suitable for achieving the objectives.

National Program Leader (primary)	**Date**

These officials have not performed a scientific merit peer review. Their statements merely express that the research being proposed will be fully funded and technically supported by the research team's Management Unit. Agency approval to implement this project plan shall not be granted without plan certification and external scientific peer review coordinated by the Office of Scientific Quality Review, ARS, USDA.

NOTE: Signature blocks are for applicable persons or their surrogates. Digital signatures are acceptable.

Table of Contents

The following sections should tell a credible story that supports the ARS mission.

(Pages numbers denote maximums unless otherwise indicated; lack of adherence will result in a return to the author for compliance.)

Project Summary

The audience of the project summary are both internal and external to ARS.

This project summary will need to convey the take-home message of your plan.

In 300 words or less, in active voice, provide:

- A clear overview of the problem(s) to be addressed
- Why you are doing this research (knowledge gaps that need to be considered before the problem can be solved)?
- What you will do?
- How you will do it, briefly?
- What is the expected impact, and who are the impacted stakeholders?

Background through Approach and Procedures should be between 12-27 pages, solely dependent on the number of SYs listed in the plan (see first page of template for maximum page numbers).

Background

Need for Research/Relevant Literature

Relevance to ARS National Program Action Plan XXX

- Link the project objectives to the goal of National Program
- State the National Program Component(s) and Problem Statement(s) from the PDRAM

Description of Problem to be Solved

- Discuss the problems that this research will target
- Focus on what is lacking in the respective field of work

Anticipated Deliverable(s)

- Discuss products and outcomes of this research and potential benefits

Customers

- Define customers and stakeholders who will benefit or otherwise have an interest in this research and/or its results

Related Research - Coordination with other projects (ARS and non-ARS)

- Demonstrate how your project is coordinated or associated with other ongoing research projects in and outside of USDA
- Show linkages and relation to other, related and similar, work
    - important when there are related or analogous ARS projects
    - important if there are significant efforts outside of ARS; demonstrating your knowledge and/or cooperation with them can be important
- Describe the latest developments in your field
- Discuss how other research supports your plan for research
- Avoid repeating details from prior sections

Contributions to the field

- How will the generated data impact the field?
- How are the current research gap(s) addressed through the proposed project plan?

- Discuss the benefits to producers and consumers of agricultural commodities.
- Clearly articulate how the proposed project will eventually lead to public benefit

Approach and Procedures

Objectives/Sub-objectives

Objective 1: Verbatim from PDRAM

Sub-objective 1.A:

- Create credible, scientifically testable hypotheses or research goals related to the objectives
- Avoid overly complex statements and words such as “may” or “might” or “could”
- Focus on the experimental design, not the research team or scientific background
- Research objectives should be testable within a 5-year period and scientifically sensible
- All sub-objectives must relate to their “parent” objective from the PDRAM
    - If applicable and intended, describe how objectives/sub-objectives are interrelated
- Illustrate research (Objective) and personnel integration

Collaborations:

- Include any affiliations
- Describe specialized resources or contributions
- Attach supporting letter to plan

Changes in the PDRAM-driven objectives require ONP concurrence and OSQR verification of the approved changes.

Contingencies:

- Consider contingencies that will be undertaken should it not be possible to achieve the stated Objectives/Sub-objectives due to new scientific discoveries, unexpected results, or unexpected complications in acquiring needed data
- Clearly articulate research constraints, lack of expertise or technologies – do not mislead the reviewer
- Discuss approaches and milestones that will be considered if the initial research plan is unsuccessful in evaluating hypotheses or attaining stated objectives
- Describe the basis for modification of sub-objectives as you gain results

Resource and Data Management (3 pages)

Resource Management – Provide one page to describe physical and human resources.

- Describe major physical resources (*i.e.*, facilities, major instrumentation and equipment, etc.) that are or will be made available to accomplish the research.
- List project plan personnel (postdocs, technicians, students, etc.) who are planned to take an active role in carrying out described research, in-house or available with a cooperator or collaborator.

SEE EXAMPLE BELOW:

> Dr. Alpha will oversee soil C and N measurements, plant sampling and analyses, gas sampling, and data analyses. His GS-11 Postdoctoral Associate will devote 1.0 FTE to Sub-hypotheses 2b and 2d. His GS-9 Support Scientist, GS-9 Technician and two undergraduate students will devote 0.5, 0.3, and 0.5 FTEs, respectively, to Objective 2. Dr. Beta will conduct the intensive CO2 flux measurements. A constant temperature room, infrared gas analyzer, automated colorimetric analyzer, and CNS analyzer are all available in Dr. Alpha's lab or nearby labs to which we have access. A deep-core sampler is installed on a pickup truck and is available for use at the location. The rainfall simulator for measuring soil water infiltration, runoff, and sediment transport has been built and is being calibrated by Drs. Alpha and Gamma.

- If personnel vacancies exist in the project plan:
  - 1st consider leaving them out of the plan and having an ad hoc review performed at a later date OR
  - 2nd discuss the expertise, discipline, and expected contribution of the new scientist to specific objectives, and include the following language:
    "***Due to a temporary reduction in resources/vacancies, which are being negotiated with the ARS administration to fill, Objective-XYZ or Sub-objective-XYZ will be deferred, or partially investigated by Dr. ABC, until qualifying personnel/additional resources are secured. Every effort will be made to investigate Objective-XYZ or Sub-objective-XYZ until it becomes evident that the vacancies/resources cannot be filled, at which time a revision in Objectives/Sub-objective will be submitted for consideration by the Office of National Programs.***"

    OR

  - 3rd if there is a postdoc or other research scientist that is able to fill the vacancy gap, describe such.

Data Management Plan – Provide up to two pages describing how data and metadata used and developed during the research project will be managed and shared both during and after the research period. Unless prohibited by law (*e.g.*, personally identifying information, PII), any such data should eventually become available to the general scientific community. Describe the following:

- Expected Data Types
  - Provides a description of the data generated by the study (e.g. environmental data gathered through real-time sensor readings; genomic sequence data). Metadata describing the data

should be recorded for each experiment, this may include information regarding instrumentation and its configuration embedded in the files produced by sensors or sequencing machines. The plan should indicate if the study will use data from other studies and their source.

- Data Format and Standards
  - Describes the data formats (e.g. csv, pdf, doc) for both raw and processed data. The plan will also describe any plans for digital conversion of non-digital data. Metadata and data standards will be recorded in this section of the plan. It is strongly encouraged that researchers will use community-recognized, non-proprietary standards (e.g. ICASA Master Variable List; Gene Ontology; Integrated Taxonomic Information System).
- Data Storage and Preservation of Access
  - This section of the plan discusses how the data will be managed throughout the active phase of data gathering and analysis and identifies the provisions made for depositing experimental data in a trusted/certified repository for long-term preservation and archiving at the conclusion of the study. The section will indicate the anticipated storage needs; retention period for the data; and contingency plans to avoid data loss.
- Data Sharing and Public Access
  - Describes data sharing within project teams during and after data collection. Explanation for: restrictions; embargo periods; and licensing. Descriptions of the public access provisions intended use for the data, suggested citation and fund codes. Provided in this section any justification for extended embargo periods and the plan to ensure research personnel are capturing adequate metadata and robust data management throughout the active experimental phase to guard against data loss. Summarizes the data publishing timeline.
- Roles and Responsibilities
  - This section outlines who will take the lead to ensure the Data Management Plan is implemented. Establishes the contingency plan if key personnel leave the project. Ensures sufficient resources are available for data management.
- Monitoring and Reporting
  - Describes how the project will be monitored and who and where reports will be filed to document the implementation of the Data Management Plan.

For additional information: https://www.nal.usda.gov/ks/guidelines-data-management-planning

Milestones

- Specify achievements and the target dates
  - EX: Complete a database by 3rd quarter of 2021
- Milestones should allow for determination of whether or not progress is being made
- Display effective planning by linking milestones to objectives
- List conceivable milestones (legitimate reasons allow for creation of a new milestones)
- Illustrate the relationships among objectives, overall goals, or outcomes
- Use table provided below
- Information provided should allow for stand-alone document
- 9-pt, Calibri font

SY Team:

Project Title	New Title
Project No.	Same number as in footer
National Program (Number: Name)	
Objective	From PDRAM 1:
NP Action Plan Component	From PDRAM for that objective
NP Action Plan Problem Statement	From PDRAM for that objective
Sub-objective	1A: Match the Objectives section; use only if there are Sub-objective(s) associated with the objective.
Goal/Hypothesis	

SY Team	Months	Milestone	Anticipated Product	Progress/Changes
	12			*This column for Area Office plan management.*
	24			
	36			
	48			

	60			
Goal/Hypothesis		If multiple for the Sub-objective		
SY Team	Months	Milestone	Anticipated Product	Progress/Changes
	12			
	24			*This column for Area Office plan management.*
	36			
	48			
	60			

Bibliography (no page limit)

Literature Citation(s)

- This is not to be a comprehensive bibliography
- List the literature relevant to each objective and sub-objective
- Literature cited should be sufficient to demonstrate investigators have current knowledge and understanding of their respective fields of study
- Published results of past project plans or other preliminary results of the investigators relevant to the current project plan should also be cited
- All citations should be a consistent format

Accomplishments/Achievements (4* pages)

***Pages may vary based on number of SYs listed in a project plan.**

Investigator(s) Past Performance

- Accomplishments of each investigator (2-page CV maximum per SY which includes most important references to this project plan)
- Include most significant accomplishments and impacts related to the proposed work
- Include applicable funding, internal and external to USDA (grants, etc.)

Previous Project Results (2 pages)

- Achievements/results of previous project(s) related to present project plan
- Relevant publications (no time limit)
- Discuss how the proposed research builds on past accomplishments (if applicable)
- Tabular/bulleted format is acceptable

Issues of Concern Statement (2-3 pages)

Issues of Concern Statement should address those relevant to your plan. Include any obstacles which involve collaborators and any of the following:

- Animal Care. Where animals are part of the research, indicate responsible authority (Institutional Animal Care and Use Committee) for assuring and monitoring compliance, including either chair or overseeing official.
- Endangered Species. If there is potential impact to endangered species, it should be noted along with the monitoring authorities relevant to assuring appropriate protection and compliance.
- National Environmental Policy Act. ARS research may be categorically excluded if, (per NEPA 7 CFR 520) it can be demonstrated they are "… of limited size and magnitude or with only short-term effects on the environment…An environmental assessment shall be prepared for an activity which is normally within the purview of categorical exclusion if there are extraordinary circumstances which may cause such activity to have a significant environmental effect."
- , Categorically Excluded under the National Environmental Policy Act regulations. If this is confirmed to be the case, plans can state "On the basis that this Federal project is undertaken for the sole purpose of conducting research, this project is categorically excluded, in accordance with the National Environmental Policy Act (NEPA)."
- Human Studies. Relevant plans must document their compliance with regulations and policies regarding the use of human subjects and identify the responsible office or authority for assuring and monitoring compliance. ALL plans should address this. Where it is not applicable, a statement that the research does not involve human subjects must be included.
- Laboratory Hazards/Safety. Training and, where appropriate, certification of research personnel with regard to biosafety must be indicated. Indication of the authority responsible for assurance of compliance and monitoring is needed.
- Occupational Safety and Health. Training and, where appropriate, certification should be stated, and the relevant office or officer with regard to Safety and Health should be identified.
- Biosafety/Biosecurity/Quarantine. The institutional biosafety committee (IBC) relevant to work at the location and its chair at the time of submission of the plan should be identified for ALL plans. If relevant, an IBC license number must be included. Appropriate training and, where relevant, certification should be noted. Where potential exists (rare) for research to be considered as Dual Use Research of Concern (DURC) it must undergo review coordinated by the NPL to assure that the plan can be sent to external review (For further information on DURC see ARS Policies and Procedures 621 "Dual Use Research of Concern" (www.afm.ars.usda.gov/media/10456/6210.pdf). Where issues related to quarantine exist, appropriate training and/or permits should be indicated.
- Intellectual Property. All plans should, at minimum, state that intellectual property issues are coordinated through the ARS Office of Technology Transfer and the Area (note which Area) Technology Transfer Coordinator. If there are Agency, Department, or international agreements or laws that limit dissemination of results, identification, import, or distribution of materials (including national sovereignty issues such as for biological resources), or procedures in the plan, or that have other related impacts, they should be noted here.

List of Acronyms and Abbreviations (no page limit)

STANDARD TERMS BELOW, ADD AS NECESSARY

AA	Associate Administrator
AAD	Associate or Assistant Area Director
AC	Administrator's Council
AD	Area Director
ARS	Agricultural Research Service
ARIS	Agricultural Research Information System
CRIS	Current Research Information System
DA	Deputy Administrator
LS	Lead Scientist
NACA	Non-Assistance Cooperative Agreement
NAL	National Agricultural Library
NPL	National Program Leader
ODA	Office of the Deputy Administrator, ONP
ONP	Office of National Programs (formerly NPS)
OSQR	Office of Scientific Quality Review
PA	Program Analyst
PDRAM	Program Direction and Resource Allocation Memo
RL	Research Leader
SQRO	Scientific Quality Review Officer
SY	Scientist Year

Letters of Collaboration or Cooperation (no page limit)

- Each letter should be specific about the role of the collaborator and what each collaborator contributes to the described research (your Approach and Procedures section should put these contributors in context)
- Generic statements of collaboration should be avoided
- Seek letters early in your project plan writing as they are a requirement to constitute a complete plan
- If a contributor is listed on the cover page as an SY, a letter is not necessary
- If a NACA exists, provide a letter from the cooperator that states such and describes the role the cooperator plays in the Approach and Procedures. A copy of the NACA agreement in lieu of a letter is acceptable
- For all letters of collaboration, include an alphabetized list of collaborators with organization affiliation and the relevant Objective or Sub-objective (*e.g.*, Doe, Jane - ABC University, Sub-Objective 1A) and copies of the letters in such order with pagination

Appendices (3 pages)

- Optional section, up to 3 pages maximum
- List by page number
- Supplementary materials that are essential to the plan

Appendix 3. Guide for Consensus Class Assessment of project plans.

Most plans do not fall neatly into one of these categories but have some well-defined objectives and others that are not. Reviewers should balance the significance of strong or weak portions when scoring.

Action Class	Approach & Procedures	Probability of Success	Merit & Significance
No Revision Required	Well-conceived, clearly articulated plan	Sufficient training and experience	Important outcomes fit the National Action Plan.
	Addresses the stated research goals.	Reasonable approach; available staff, equipment, facilities.	New knowledge, technology, or results of value.
	Appropriate and sufficient methods.	Awareness of current literature in the area.	Similar work not conducted elsewhere.
Minor Revision Required	Well-conceived plan, sound approaches	Sufficient training and experience	Important outcomes fit the National Action Plan.
	The project addresses the stated research goals.	Reasonable approach, available equipment, facilities	New knowledge, technology, or results of value.
	Requires minor modifications	Awareness of current literature in the area.	Similar work not conducted elsewhere.
Moderate Revision Required	Sound, but not clearly articulated.	Most training, experience available, could be strengthened. some modification needed	Important outcomes fit the National Action Plan.
	May need some modification to fit stated goals	Most necessary equipment, essential facilities available, could be strengthened.	New knowledge, technology, or results of value.
	Revision may involve changes to approaches.	Awareness of most current literature.	Similar work may be conducted at other locations.
Major Revision Required	Approach to one or more objectives may not address the stated goals.	Team lacks some important training or expertise	One or more of the out-comes may not significantly impact the National Action Plan.
	Poorly written; major revision of one or more objectives necessary.	Methods not in line with resources; critical equipment, facilities not available; unawareness of significant current literature.	Does not lead to new knowledge/technology.
Not Feasible	Major flaws or inadequate approaches for one or more objectives	Substantive deficiencies in essential expertise/facilities.	One or more of the out-comes may not significantly impact the National Program Action Plan.
	Procedures unrelated to stated goals.	Unawareness of significant current literature.	Does not lead to new knowledge/technology.

Appendix 4: Scientific Quality Review Officers

ARS is grateful to these very busy and accomplished individuals for their service as Scientific Quality Review Officers (as of 2011, terms begin and end with the fiscal year).

Stephen O. Duke	1999-2000
Steven C. Huber	2000-2001
Bruce Campbell	2001-2002
Frank Greene	2003-2004
Jerry L. Hatfield	2005-2006
Thomas (Ed) Cleveland	2007-2008
Donald P. Knowles	2009-2010
David Marshall	2011
Joyce Loper	2012-2013
Michael Grusak	2014-2015
Scott Yates	2016-2017
David Shapiro-Ilan	2018-2019
Todd Ward	2020-2021
Weidong Chen	2022-2023